

REMARKS

Claims 10-15 are pending. By this Amendment, claim 14 is cancelled, claims 10 and 15 are amended, and no claims are added.

**Telephonic Interview Summary**

Applicants thank the Examiner for the courtesy extended to its representative, Daidre Burgess, in a telephone interview on April 16, 2009. During the telephone interview, proposed amendments to claim 10 and the cited art were discussed.

**Claim Rejections -35 U.S.C. § 112**

Claims 10-15 stand rejected under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, and in particular the relationship between the structured hard chrome layer and the chromium. Applicants respectfully traverse the rejection. One of ordinary skill in the art would recognize that chrome is defined as chromium or a chromium alloy. *See, for example,* <http://www.merriam-webster.com/dictionary/chrome>. Therefore, by definition, a structured hard chrome layer inherently includes chromium. Applicants respectfully request withdrawal of the rejection.

**Claim Rejections – 35 U.S.C. § 103**

Claims 10-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over European Application No. 1,205,582 or U.S. Patent No. 6,837,981 both to Horsthemke in combination with U.S. Patent No. 4,588,481 to Chessin et al. Claim 10 has been amended to include the limitation “wherein the electrolyte comprises substantially no fluorides....” Insofar as the rejections apply to amended claim 10, Applicants respectfully traverse the rejections.

Neither Horsthemke nor Chessin et al., taken alone or in combination, disclose or suggest or provide a rational basis for this limitation in combination with the other limitations of newly amended claim 10.

Horsthemke teaches away from the present disclosure in that Horsthemke is directed to a “method for the electrolytic coating of materials...whereby a chromium alloy is deposited from an electrolyte, comprising a least chromic acid, sulphuric acid, an isopolyanion-forming metal, a short-chain aliphatic sulphonic acid, the salts and/or halo-derivatives thereof and *fluorides*.” Abstract (emphasis added). Horsthemke discloses that the “addition of fluorides advantageously causes the deposited layers to have a smooth surface and high gloss and to be characterized by good adhesion” thereby “[i]ndustrially usable layers are deposited.” Col. 3, lines 19-22. *See also*, Col. 5, lines 19-30.

In contrast, the presently claimed method includes an electrolyte substantially free from fluorides because “[i]f fluorides are present in the electrolyte, this will interfere with the formation of the structured hard chrome layer.” Page 4 of the originally filed application; paragraph [0031] of the published application. The absence of fluorides from the electrolyte of the claimed method allows the formation of a hard chrome layer exhibiting a surface topography “at least one of a cup-shaped structure, a labyrinth structure, or a column-shaped structure” rather than the glossy, laminar structure disclosed in Horsthemke.

Per MPEP § 2143.01(V), “[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” Clearly, Horsthemke teaches that the addition of fluorides aides in the intended purpose of forming a precipitated layer having a smooth surface and high gloss, and that the absence of such fluorides would render the precipitated layer

unsatisfactory, as evidenced by Example A (col. 5, line 65 – col. 6, line 17). Chessin et al. does not make up for the deficiencies of Horsthemke as described above. Therefore, the Examiner has failed to make a *prima facie* case of obviousness for at least this reason.

Additionally or alternatively, neither Horsthemke nor Chessin et al. disclose or suggest “wherein a cathodic current yield in the production of the structured hard chrome layer is 12% or less...” as recited in claim 10. Horsthemke discloses a cathode efficiency of at least 15% (col. 5, lines 51-59), and Chessin et al. discloses cathode efficiencies of at least 22% (col. 2, lines 18-19; Table II). The Examiner points to the disclosure of Chessin et al. at col. 1, lines 31-36 describing the prior art efficiencies between 12% and 16% (Office Action, page 5); however, the disclosure in Chessin et al. at this location is describing the disadvantages of using lower efficiencies, clearly teaching away from these lower efficiencies. Therefore, per MPEP § 2143.01(V), the proposed modifications to Horsthemke and Chessin et al. as suggested by the Examiner render the prior art invention being modified unsatisfactory for its intended purpose, and there is no suggestion or motivation to make the proposed modification. The Examiner has failed to make a *prima facie* case of obviousness for at least this reason.

Moreover, as the comparative examples in the declaration of Rudolf Linde indicate, cathodic current yields above 12% or the addition of fluoride is detrimental to the wear resistance and the seizure resistance of piston rings coated with the corresponding hard chromium layers. Therefore, there is a significant improvement of the hard chromium coatings prepared according to present claimed invention compared to hard chromium coatings of the prior art.

It is respectfully submitted that newly amended claim 10 is allowable for at least these reasons. Claims 11-13 and 15 depend from claim 10 and is allowable for at least the same reasons claim 10 is allowable.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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